AMT - Beam generated heat deposition and quench levels for LHC magnets



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Case study: Energy deposition in superconducting magnets in IR6

A diluter block TCDQ, with a collimator TCS and shield TCDQM, will be installed in front of the superconducting quadrupole Q4 magnet in IR6, to protect it and other downstream LHC machine elements from an unsynchronised beam dump. The system should also intercept particles in the abort gap to prevent quenches during regular aborts, and must also intercept the particles from the secondary halo during low beam lifetime without provoking quenches. The conceptual design of the system is briefly presented, and the FLUKA energy deposition simulations described. The results are discussed in the context of the expected performance levels for LHC operation, in particular for the problems associated with quenches. Options for improvement are elucidated and required future work is defined.

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